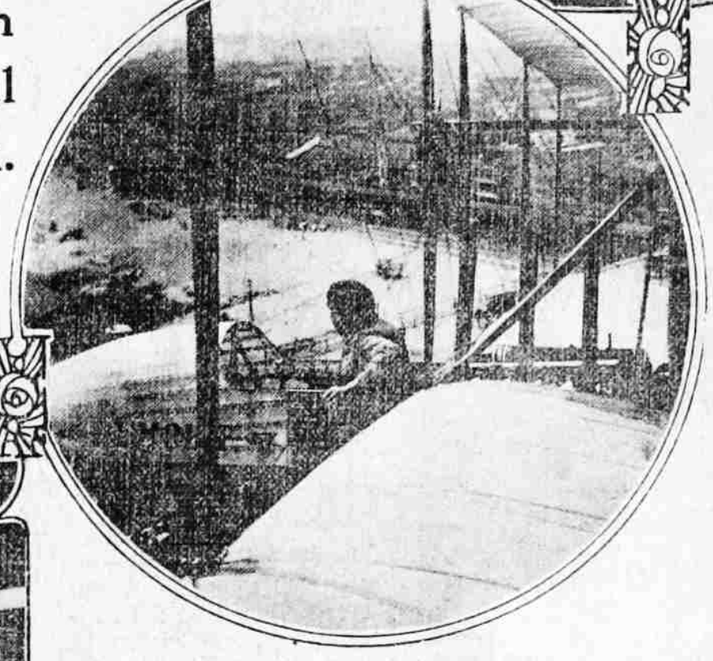
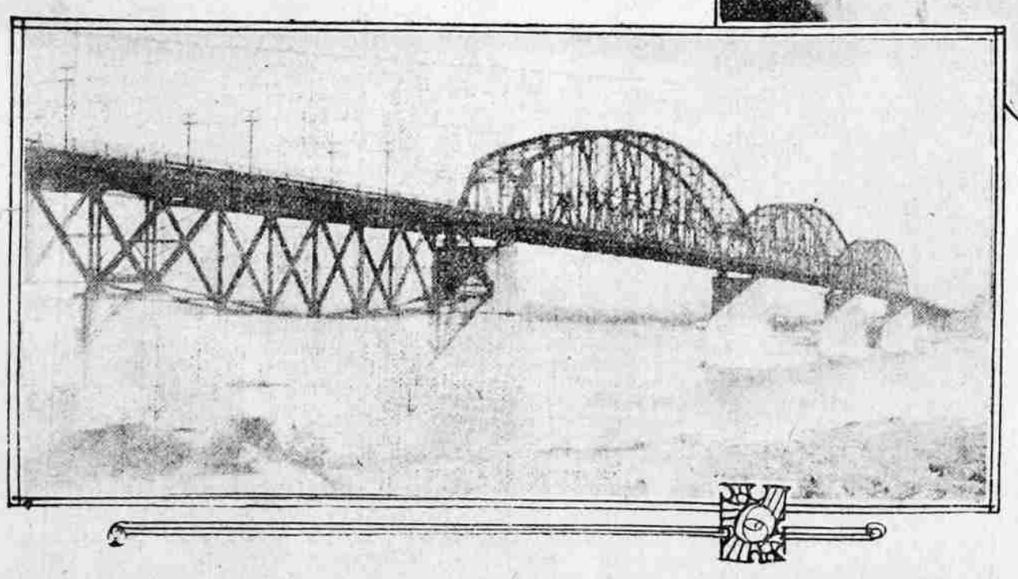
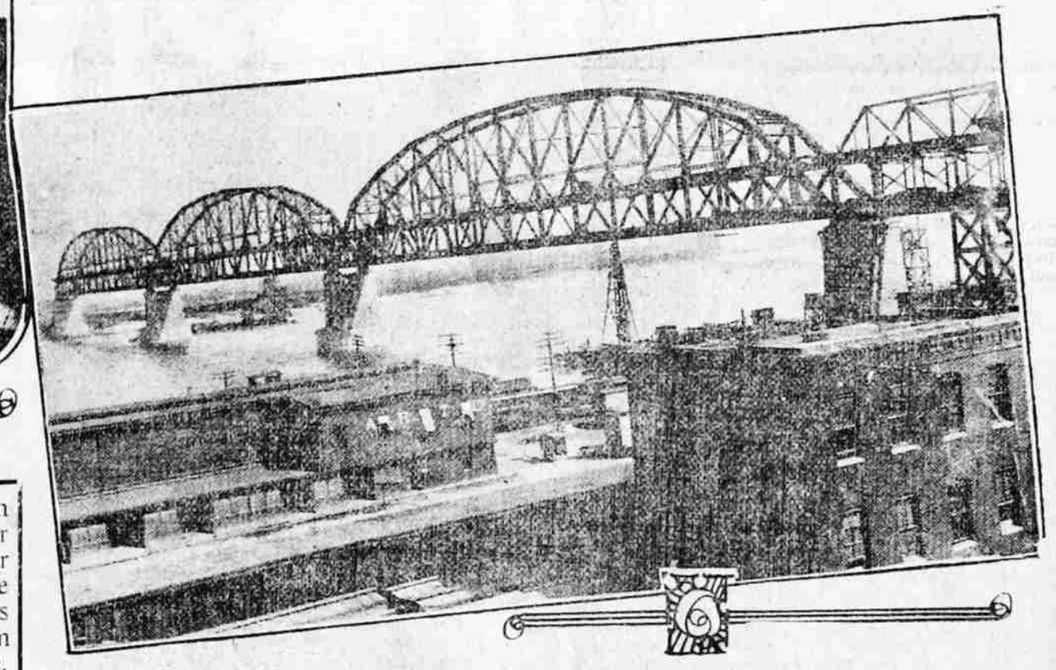
Guarding Our Bridges

Millions in Money and an Army of Men Needed for Inspection of Our American Spans and for the Annual Painting and Repair Work.







UPPER LEFT—Brooklyn Bridge, and a painter at work on a railing. Upper right — Manhattan Bridge afire. In circle — Eads Bridge, photographed from the wing of an aeroplane. Lower left — McKinley Bridge across the Mississippi. Lower right—Another bridge across the Mississippi in course of construction.

One of the important details of the modern military arrangement is to have plenty of watchmen on hand to guard the bridges in time of war. Every bridge in Germany is carefully guarded. The same is true of the bridges in England, Russia and France. If these places were not guarded spies could dynamite the bridges and tie up troop movements.

It takes days to rebuild bridges, and in the meantime battles can be won.

But in this land of peace there are even now whole companies of men guarding the bridges. The business of keeping the bridges in repair and watching them costs millions in money annually. On every big bridge there are inspectors and watchmen for day and night work. Spanning our great central waterway, the Mississippi River, there are many big bridges which require much attention. But these bridges are only part of the great bridge work of the country. All through the Rocky Mountain regions and all through the East there are immense bridge structures, which require constant attention. In time of storm and in time of calm, these bridges need constant watching.

New York City, with her forty-five big bridges, has the most complete system of inspection in the country.

Some years ago something gave way on Brooklyn Bridge. Tammany Hall and the bridge's thousand of patrons got a bad scare. The fright was caused by what the break signified. It was not altogether that a piece of metal had quit performing its duty. The inspection service was so poor that the danger had not been discovered until something actually let go. The question was, "Is the whole structure honeycombed with rust and undiscovered fractures?" Nobody knew. That was what scared Tammany Hall and the public. Tammany Hall officials were in charge of the structure.

The bridge has never suffered for lack of paint or inspection since. The present bridge commissioner, Frederick H. Kracke, is a greater believer in the free application of paint and of preventive measures than any of his predecessors. Father Knickerbocker has entrusted forty-five bridges to his care. They represent a cost to the city of scores of millions of dollars. Their maintenance occupies the time and thought of a small army of men. Much of their work is of an exceedingly dangerous character.

The huge masses which make up a bridge sway and swing in the wind, and bend and give under a heavy load, as if they were steel hammocks. They contract on a cold winter's day and expand on a hot summer's day. Their height above the water varies as much as four feet between the two seasons. Stone and steel towers alike bend and buckle under every stress and strain in a way that would terrify the uninitiated if he knew the degree to which this occurs. But rust is the chief concern of the commissioner. Keep the metal well covered with paint and the burden of the department is lightened immeasurably.

$60,000 TO PAINT BROOKLYN BRIDGE.

Painting the bridges is not a task to be undertaken lightly by the unadvised. It involves dangers not to be found in interior decorating. The bridges require a coating of this preservative as often as once in from three to five years. It is a job that every commissioner must consider at least once in the course of his term of office. Commissioner Kracke is now completing the $60,000 job of painting the old Brooklyn Bridge. The painters are scrambling all over the structure, now up on the cables 240 feet above the water, now on narrow foot walks between the vertical girders inclosing the elevated tracks and the third rail, trains passing at minute intervals within elbow reach; and now on scaffolds suspended beneath the bridge with nothing but a plank separating them from the waters of the East River 100 feet below, and the masthead of a passing schooner threatening to tear their foothold from the structure.

It is said that the human body is practically renewed once every seven years. Particle by particle the old, worn out tissues are replaced by fresh. In this respect a steel bridge, especially one of the suspension type, is like the human body: Its innumerable members are constantly being replaced. The riveter, like the inspector, is always on the job. The swaying due to passing trains and the wind, and the expansion and contraction due to changes in temperature, even changes due to the position of the sun in the course of the day, all tend to cut off rivets and loosen bolts.

This last factor in the wear and tear on the fabric of a bridge is more important than most persons would think. In this latitude the sun is always south. Should a bridge run east and west, one side during the period of daylight would be continually subjected to the direct rays of the sun. The opposite side rarely, if ever. The sunny side of the bridge will be appreciably longer than the shady side, due to the fact that the heat of the sun's rays expands the metal work. This condition is actually found in the three suspension bridges over the East River. The Brooklyn and Williamsburg bridges run almost due east and west. On those structures the steel work on the south side is always expanded more in the middle of the day than the north. In the case of the former bridge little trouble results, owing to the lightness of the structure, but on the latter, suspended, as it is, by the main span only, there is an eccentric movement of the steel members. As a result it became necessary to cut off the flanges on the floor girders. There was danger that they would chafe against the suspenders and perhaps cut them off, as with a saw. It was also necessary to remove the flanges of the legs of the main towers in order to eliminate the danger due to the landward pressure of the massive chords of the trusses. The expansion was so great that it threatened to push the towers toward the shore. In this bridge there is an almost constant excess of length on the south side over the north side of about three inches.

Just at present a gang of thirty-five riveters are laying a steel curb along the roadway of the Brooklyn Bridge.

SPEED RETARDED TO PREVENT JAR.

In order to protect the bridges everything feasible is done to save them from unnecessary jars, shocks and other nerve-racking experiences. This means that as far as possible the railroad companies and the traveling public using the bridges shall not be permitted, through the employment of defective equipment, to injure or overstrain the structures. Too high speed, flat wheels, sudden stopping and starting of trains and various other forms of carelessness on the part of the operating companies may have a very serious effect on the condition and safety of the fabrics.

The routine of an average day's maintenance work on one of the big East River bridges calls for carpenters, steel workers, painters, cleaners and men to make ordinary unspecialized repairs. The maintenance also includes the care of the properties under the bridges and that taken for the protection of the bridges.

Incidentally, it may be added that the roadways of the East River bridges present an interesting and vexing problem. The Brooklyn Bridge, for instance, will not bear the weight of stone paving, and in consequence wood paving of some sort has to be employed. The roadways require hundreds of thousands of square feet of spruce planking. Large gangs of men are constantly occupied keeping this in repair. Five experimental pavements of wood blocks are being tested out on the north roadway on the Brooklyn tower, in the hope of discovering a more economical and better wearing pavement. The way on the Williamsburg Bridge was laid on a series of steel beams. The concrete in places has buckled, forming waves in the surface. The promenade was laid on a specially devised layer of cork, which rested on an iron flooring. Water has accumulated in the cork layer and the dread enemy, rust, has eaten away the iron base.

All in all, there is enough to keep the bridge commissioner busy, even if no new bridges are in process of construction.

Alaska's Need.

According to a certain slender, brown-eyed little woman just back from Alaska's wilderness, New York has too much civilization, too many chaperons, and not enough romance.

The first loads us with useless customs and ineffectual laws. The second robs us of "palship" between the sexes. The third causes a feverish rushing about after any and every diversion which momentarily feeds the soul and senses.

Now, out Yukon way, it's different. People live only in the things that count—courage, work, love, human sympathy. And there is lots of it going begging, especially love.

"Send us worthy women," says Alaska, "and we will show them what love and appreciation mean!"

Mrs. Robert H. Pierson, wife of a captain of the medical corps, United States Army, has just returned to eastern civilization after two years spent at Fort Gibbon.

This post is so near the Arctic Circle that you have to wear a bit of rabbit skin on your nose to keep it from freezing. And when you put a pan of boiling water on the floor for the puppy dog to drink it is solid ice before he has taken three laps of it.

"It sounds frightsome," laughed Mrs. Pierson, "but Alaska has so much to recommend that a trifle like 60 degrees below zero can be forgiven.

"In the two years I was there I met more real people and learned more of the big, fundamental things that make life worth living than in all the rest of my existence put together.

"Alaska is a land of opportunity—especially for women. A woman can go anywhere alone, whether through the wilderness driving her dog sledge or in the sturdy young cities like Fairbanks and Nome.

"Women and men pal together out in the big Northwest. They are friends, not commercial rivals or sex antagonists, as so often happens in Eastern civilization. Chaperons are unknown and unneeded.

"As for romance!" Mrs. Pierson closed both eyes and raised her hands toward the ceiling in an expressive gesture of superlativeness. "One cannot keep a housemaid. She remains a housemaid only long enough to be spied by some lonely claimstaker. After that, as the claimstaker's wife she becomes an employer of housemaids, who in turn become mine owners' wives, who in turn employ more housemaids, who in turn marry more mine owners—and so on and so on and so on!

"I used to invite school chums to visit me, and before I had had a chance to show them around they informed me they had met their ideal man and were going to be married right off.

"I never saw such an active matrimonial market. And I cannot say too positively that the Alaskan men are the most worth while of any in the world. They have to be fine men physically and morally to overcome the hardships of Alaska's wilds."

About Poland.

The National Geographic Society of Washington has given out the following information about Galicia:

Most of old Poland which survives, in race and in political consciousness, in typical culture and in folk character, survives in the Austrian crown land of Galicia. Under the more sternly repressive rule of Russian and German overlordship, the Poles in Russia and Germany have been driven little by little from their stronghold of national feeling. They are becoming half-hearted Russians and Germans, for Russia and Germany have done all in their power to assimilate the well-nigh unassimilable Pole. In Galicia, however, with a constitution of their own, under a perplexed and lenient central government, a consciousness of old Poland remains and has grown in intensity in recent times.

Hemmed in by Russia on the north and east by the suspicious border patrol, naturally cut off from Hungary on the south and southwest by the Carpathians, barely touching its sovereign Austria on the west, the Galician Pole has been left to himself, to the single handed solution of his own difficulties, political, economic and administrative. With little to prod him into violent industrial exertion, he has continued the past into the present, with its quaint customs, its devotion to agriculture and its poverty stricken idealism.

Galicia slopes away from the Carpathians to meet the boundless Russian plain on the north. Its southern uplands are devoted largely to grazing grounds for horses, cattle and sheep. In the middle lands, cereals and sugar beets are grown. The crownland is sparsely populated, and in many parts its lands are very fertile, so that more than enough breadstuffs, meat and other products are raised for home consumption, permitting the exportation of cereals and meat products in considerable amounts, mainly to Germany.

Galicia is Poland—ancient Poland—and like the Fatherland of old, its masses are miserably poor, while its classes are very rich. One-third of its tillable lands are held by great land owners in estates of more than 1,400 acres, and one-half are held in blocks of 14 acres or less. Galicia is agricultural. It has little mineral wealth and less industry. Much of its 30,321 square miles are morass, sand or forest lands, and all else is given over to farming. True, in the Carpathians are found the richest oil fields in Europe, and good zinc mines and rock salt quarries are worked. Still, its mineral wealth has small significance. The forests, which are estimated to cover one-quarter of the whole surface of Galicia, contribute to a large lumber trade with Germany.

Bolivian Ruins.

The Bolivian Government has recently enacted a law which forbids the carrying off or wilful destruction of that portion of the ruins of the ancient city of Tiahuanacu which vandal hands have left intact. Here once stood a large and populous city, but it has lain in ruins so long that even the legendary lore of the Incas, who traced an unbroken line of kings back to the eleventh century, is dumb concerning the people who built it. It lies not far from the southern end of Lake Titicaca, its ruins covering an area of about a square mile. The ruins themselves include the remnants of temples, palaces and other great structures. The ruins are located 13,000 feet above the level of the sea on a vast plateau where the constant cold prevents the maturing of corn or other grain. At present potatoes, oca and some other edible roots are grown, but the region sustains only a scanty mountain population. The city once covered a large area, the great structures were built by skilled masons. One stone is 36 feet long by 7 feet wide and weighs 170 tons, another is 26x16, and 6 feet thick. Only the monoliths of ancient Egypt equal those found in Tiahuanacu. The movement and placing of such monoliths point to a dense population, to an organized government, and consequently to a large agricultural area with means of transportation from various directions. The only tenable explanation is that at the time when Tiahuanacu flourished the Andes were from 2,000 to 3,000 feet lower than at present.

Clearing the Way.

Newrich—So she now looks forward to a perfectly happy life? Mrs. Newrich—Yes. She has snubbed the last of the old friends who knew her in the early days when she was poor.—Town Topics.